

1 SUMMARY

This report presents the results of the Lower Green River Baseline Habitat Survey, which focused on documenting current instream and adjacent riparian habitat conditions in the mainstem Lower Green River from river mile (RM) 32.1 to RM 5.7 just upstream from the Duwamish Turning Basin. This project used an approach that was consistent with previous studies of the Green River, specifically the Green River Baseline Habitat Monitoring 2001 Data Report that surveyed habitats in the Middle Green River (RM 61.5 to 32) (R2 Resource Consultants 2002). A reach-based survey was employed to be consistent with this prior work and to produce detailed documentation of spatial distribution, types, and characteristics of habitat in the Lower Green River.

The purpose of this baseline habitat survey was to collect data that can be compared with habitat surveys conducted in other portions of the river in order to evaluate habitat conditions throughout the Green/Duwamish River corridor. The survey data will also be used in ongoing Water Resource Inventory Area (WRIA) 9 (Green/Duwamish River watershed) efforts to develop habitat protection and restoration strategies in the Lower Green River sub-watershed. In addition, this survey will assist the cities of Seattle, Tukwila, Kent, Auburn, and King County in updating their Shoreline Master Programs to meet new Endangered Species Act (ESA) and Growth Management Act mandates in planning habitat restoration and other capital improvement projects for the Green River, and in designing Green River Flood Control Zone District (GRFCZD) flood control facility maintenance and repair projects.

Habitat surveys were completed during low flow conditions in September 2003. In general, the habitat conditions observed during the survey reflect the extensive alterations to the Lower Green River floodplain that have resulted from dam operations, and urban, commercial, and agricultural development. The following important insights into the current habitat conditions in the Lower Green River were gained as a result of the survey:

- **Instream habitat quality and quantity for juvenile and adult salmonids in the Lower Green River is significantly impaired.** Decades of population growth, land use changes and human alterations of the channel and floodplain have greatly simplified the stream habitat in the survey area. This survey systematically characterized the impaired habitat quality that is considered a primary factor of decline for salmonid populations in the river (Kerwin and Nelson 2000).

- **The channel is confined throughout the Lower Green River.** A nearly continuous system of levees and revetments incrementally constructed over past decades for flood and erosion control purposes prevents channel migration and limits habitat quality and diversity.
- **Bank armoring, particularly riprap, is extensive along the Lower Green River.** Armoring is extensive in areas where roads, trails, and urban development are in close proximity to the river channel and along the outside banks of bends in the river.
- **Habitat types are generally homogeneous in the Lower Green River and off-channel habitat is limited.** Glides are the dominate habitat type in the survey area and were identified in 110 of the 146 stations surveyed (75 percent). There has been extensive reduction and isolation of off-channel areas of the river.
- **The dominant pool-forming factors in the Lower Green River are manmade structures.** Riprap and bridge abutments were the dominant pool-forming factor for 31 of the 43 (72 percent) of the pools surveyed, whereas large woody debris (LWD) was the dominant forming factor for only two pools.
- **Spawning-sized gravel occurs in the upper third of the Lower Green River.** Most of the spawning-sized gravel occurs in Reach 1 (RM 32 to 26.6) and Reach 2 (RM 26.6 to 19.1). Sand and silt were the primary substrates found in the lower gradient reaches downstream.
- **The connectivity between the riparian zone and the instream habitats is severely impacted by the levees that bound much of the Lower Green River.** The levees limit the opportunity for overhanging vegetation and LWD recruitment in the area. However, in several locations, these constraints have been alleviated by flood control facility repairs that included setting back segments of these facilities landward from the river.
- **The adjacent riparian zone of the Lower Green River is dominated by invasive species and lacks native vegetation.** Invasive vegetation is extensive in the portion of the riparian corridor between the river and the top of the levees. The presence of invasive vegetation limits colonization of the riparian corridor by native vegetation, especially tree species, which could effectively provide shade, cover, and a future source of LWD.
- **Numerous stormwater and tributary outfalls of varying sizes enter the river from both banks.** The types of outfalls and the frequency and volume of outflow from them were not investigated in this survey.

Based on the observations made during this survey, further study is warranted to investigate the following habitat quality issues in the Lower Green River:

- **LWD source and recruitment.** The sources of existing LWD within the survey area are largely unknown. Monitoring or tracking woody debris recruitment in the various reaches of the Green River could be undertaken to investigate linkages between specific geographic riparian zones and pool-forming wood deposits.
- **Invasive vegetation** The abundance of invasive riparian vegetation is a concern, particularly the presence of Japanese knotweed (*Polygonum cuspidatum*), a fast-growing plant that was found over a broad portion of the survey area. Japanese knotweed had not been formally inventoried before and its presence along the Lower Green River had not been previously documented. In the future, the location of Japanese knotweed and purple loosestrife (*Lythrum salicaria* L.), should be monitored closely and actively controlled through re-vegetation with native species. Himalayan blackberry (*Rubus discolor*) and reed canarygrass are also nearly ubiquitous, especially in areas previously armored with riprap.
- **Habitat restoration and conservation opportunities** were identified during the field survey and from aerial photography. Conservation opportunities identified in this study were those locations with excellent habitat quality that generally did not appear to need any restoration. Restoration opportunities were identified where adjacent land use appeared to be compatible with actions such as the setback of banks, reconnection of side channels, or restoration of riparian conditions.